# DPM-3232

## Digital DC Power Meter with Data logging capability

## User Manual

## Introduction

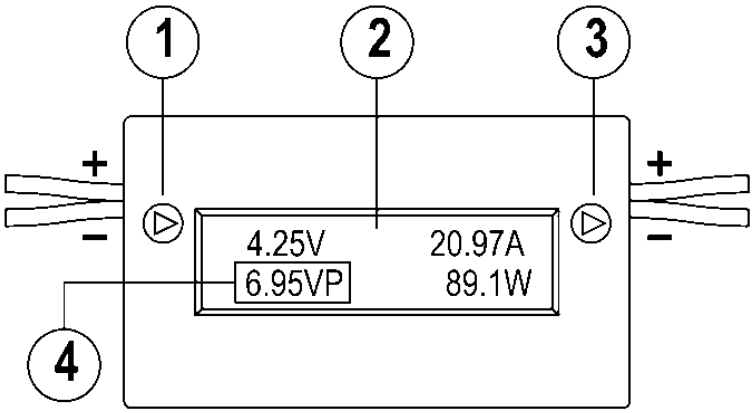
The DPM-3232 digital DC Power Meter measures and displays in real time; DC Voltage (0-60V), DC Current (0-60A) and Watts (0-3600W). It also displays; Amp-hour, Watt-hour, maximum or peak Watts, running time since Power Meter start up and minimum and maximum values of voltage and current during the measuring period. There is one pair of leads for source input and another pair for load output, the power meter can either be powered by the input or the output whichever has a minimum 5V DC available (only voltages between 5V and 60V can be measured when powered in this way). The Power Meter can also be powered by an external DC voltage of 5 to 60VDC, which then allows a voltage measurement range of 0-60V. Once the Power Meter is powered up it starts to display and log the Voltage and Current. It also displays Wattage, Amp-hours, Watt-hours, Max. & Min. Voltage and Current and peak Watts. The logged data values are recorded at a user selectable interval of 30 seconds to 3 minutes. Up to 1,500 sets of data can be stored in the Power Meter's Memory (EEPROM) so even when the Power Meter is powered down, data is retained. The data can be retrieved by a PC using the optional Data Adapter (DPA-3051) and a software program provided. Unless reset, the last set of data values; Ah, Wh, peak Current, peak Watts, (and sometimes min. and peak Voltage), is retained and displayed when the DM-3232 is powered up again. A new group of data (up to 20) is created each time. The Power Meter can be mounted using the Snap-On bracket provided or magnetically on ferrous metal surfaces.

## Precautions

a. Do not exceed 60A or 60V DC when using the Power Meter.
b. Do not apply 60A for more than 5 seconds within any 60 second interval.
c. This meter is designed for indoor use only.
d. Do not disassemble or attempt to repair the Power Meter. Return it to your service agent for repair.
e. If the start-up screen does not appear, immediately remove the power source.
f. Do not short-circuit the input or output leads. It is good practice to have both the input and output terminal blocks connected to prevent short circuits.
g. Double check the correct input and output polarity. If the input connection has the wrong polarity, the LCD display will not show. Wrong polarity on the output may result in excessive current flow.
h. Damage to the Power Meter may result if voltage is applied with the wrong polarity.
i. Do not exert pressure directly on the LCD display as damage may occur.

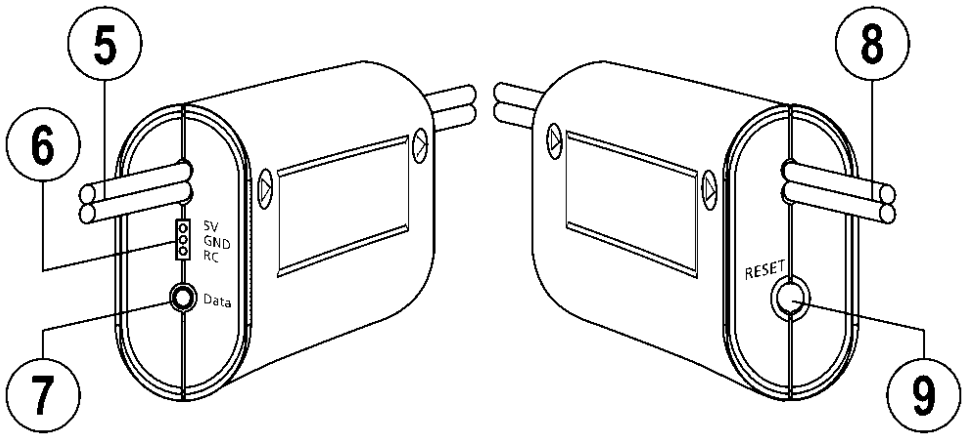
## Controls and Indicators

**FRONT**




1. Arrow Mark to show Input (Source) leads
2. LCD Display : Displays: V, A, and W continuously.
   Scrolling display : Amp Hour (Ah), Watt Hour (Wh), Peak Voltage (Vp), Peak Current (Ap), Peak Watts (Wp), Min. Voltage (Vm) or sag, Min. Current (Am) and total time since power up.
3. Arrow Mark to show Output (Load) leads
4. Scrolling display : Any one of the scrolling displays can be halted at any time (and also released) by one quick press of the "Reset" button (9)

**SIDE**

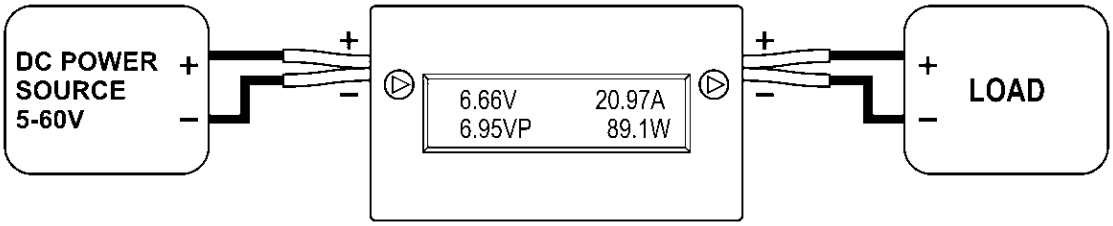



5. Input Source leads
6. External Power Socket:
   An external power source (5-60VDC) extends the measured voltage range from 5-60V to 0-60V.
   Pins: 5V-GND-RC
   5V = +5V to +60V external DC source.
   GND = Ground or negative of external DC source.
   RC = Remote Clear, this is for deleting the stored data.
7. Phono Socket: for connection to optional Data Adapter (DPA-3051).
8. Output Load leads.
9. Reset Switch: To clear saved data and to setup the unit and halt/continue display scrolling.

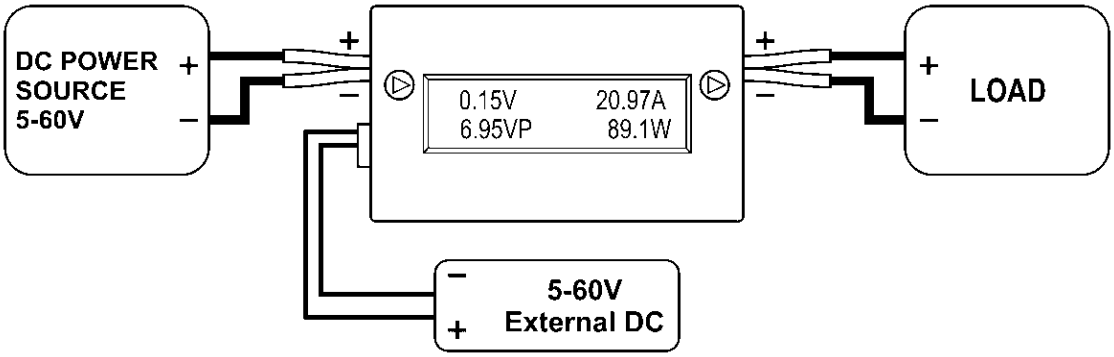
## DPM-3232 Connections

**A. The following are some examples for four wire meter connections.**

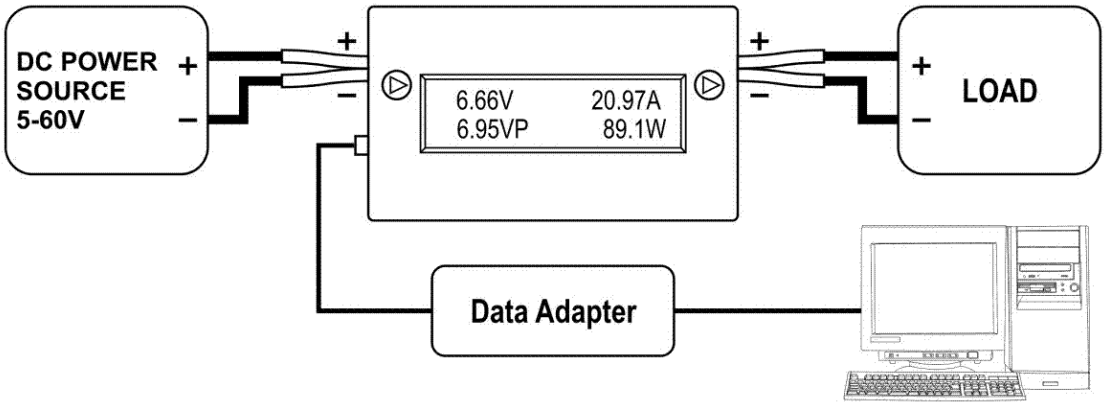
**A1. Standard connection**




**A2. with external DC connection**

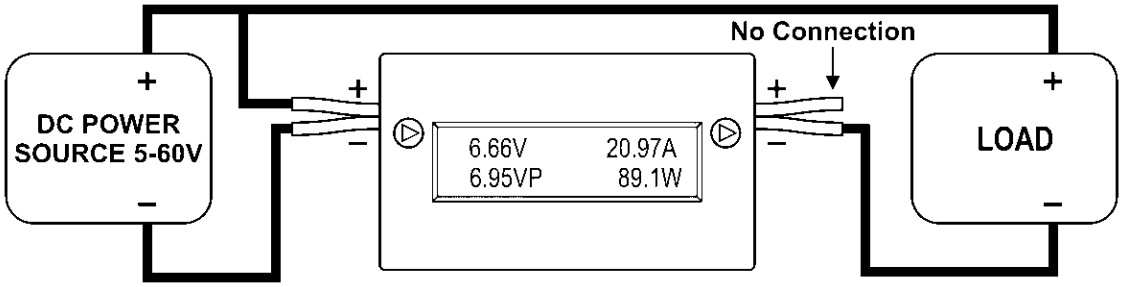


**A3. with optional Data adapter**

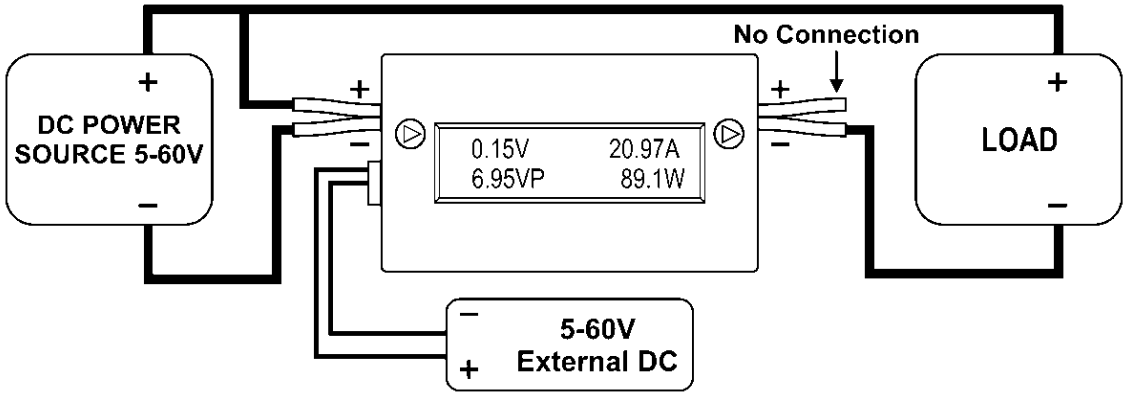



**B. The following are some examples for three wire meter connections.**

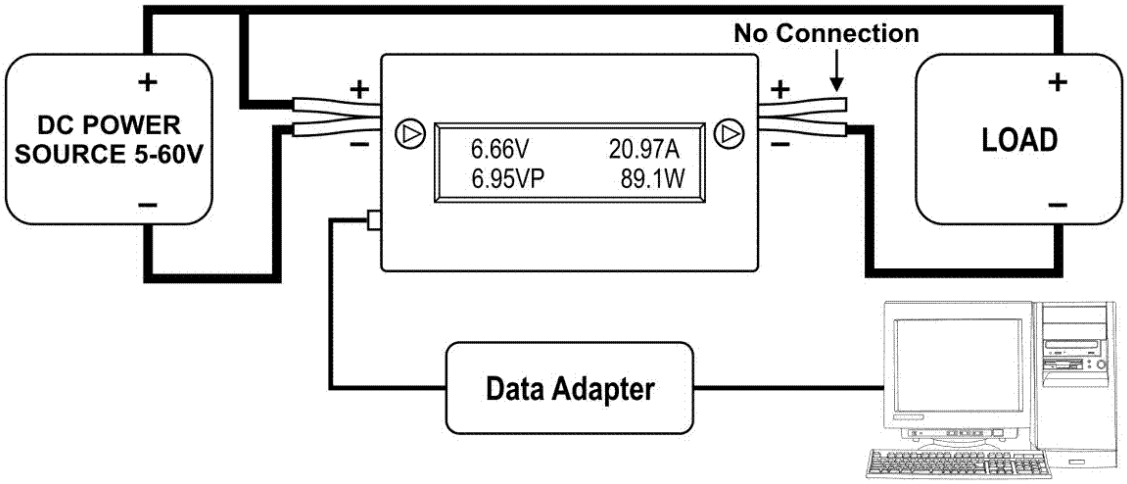
**B1. Standard connection**




**B2. with external DC connection**




**B3. with optional Data adapter**



## Operation and Display Screens

**Installation of the DC Power Meter:**

1. First connect the input source leads from the DC source to the meter and check that the DPM powers up. If no display appears then check for reverse polarity and ensure that the voltage is greater than 5 Volts.
2. The last set of accumulated data will appear on the LCD. The old data can be cleared by pressing the Reset Button for 5 seconds twice. See the "Resetting the DPM-3232" section for more information.
3. Connect the remaining leads to complete the installation of the DC Power Meter.

**Setting the data logging time interval:**

1. DPM will display the "Sampling time" setting when it powers up. To enter the sampling time setup mode, **PRESS** and **HOLD** the "RESET" button for 5 seconds whilst "Sampling time" is displayed.

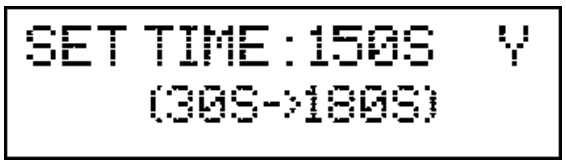
2. The sampling time can be set as whole seconds between 30 and 180. Input starts from the left-hand digit and moves to the right. The digit being set will flash.

3. A short press of the "RESET" button will change the value of the digit.

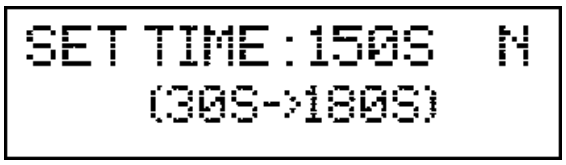
4. **PRESS** and **HOLD** the "RESET" button to confirm the digit. It displays OK then it's ready for the next digit.

5. Repeat steps 3 and 4 for all digits.

6. After all three digits have been entered; a "Y" is displayed to confirm the entry.




7. To abort the entry, apply a short press to the "RESET" button to change "Y" to "N". Then **PRESS** and **HOLD** "RESET" button to start the "Sampling Time" setup again.



8. If the entry is correct, then **PRESS** and **HOLD** the “RESET” button to confirm. OK is then displayed confirming the sampling time set. The DPM then enters the operation mode.

**OTHER DISPLAYS:**

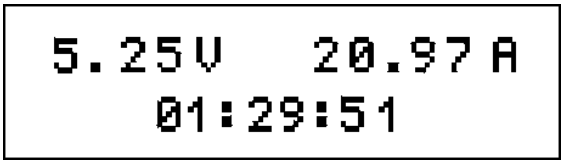
A. On first powering up the display, the firmware version and factory preset data port mode are shown.

B. Measured Data Display

C. The Volts, Amp and Watt are continuously displayed; all other data is shown cyclically at about 3 second intervals. The display can be toggled between fixed and cyclical by one quick press of the "Reset" button (9).

1. **Current (Amps - A, Peak Amps - Ap, Minimum Amps - Am):**
   The Amps value is the average current through the Meter's black wire over the last screen update interval. Ap is the Peak (maximum) current to the LOAD, since start up to the present time. Similarly, Am is the minimum current.
2. **Voltage (Volts - V, Maximum Voltage – Vp, Minimum Voltage - Vm):**
   The Volts value is the average voltage over the last screen update interval. Vp is the Peak (maximum) voltage from the source side since start up to the present time. Similarly for Vm (minimum) which is the minimum voltage on the source side since start up.
3. **Charge (Amp-hours - Ah):**
   The value displayed is the total charge in Amp-hours delivered to the LOAD since start up. The Amp-hours is determined using the internal clock of the MCU.
4. **Energy (Watt-hours - Wh):**
   The value displayed is the total energy delivered to the LOAD in Watt-hours since start up. The Watt-hours is determined using the internal clock of the MCU.
5. **Power (Watts - W, Peak Watts - Wp):**
   The value displayed is the average power delivered in Meter over the last screen update interval. The displayed Peak Watts value (Wp) is the maximum power drawn of the LOAD, since start up.

## OPERATION TIME SINCE START UP:

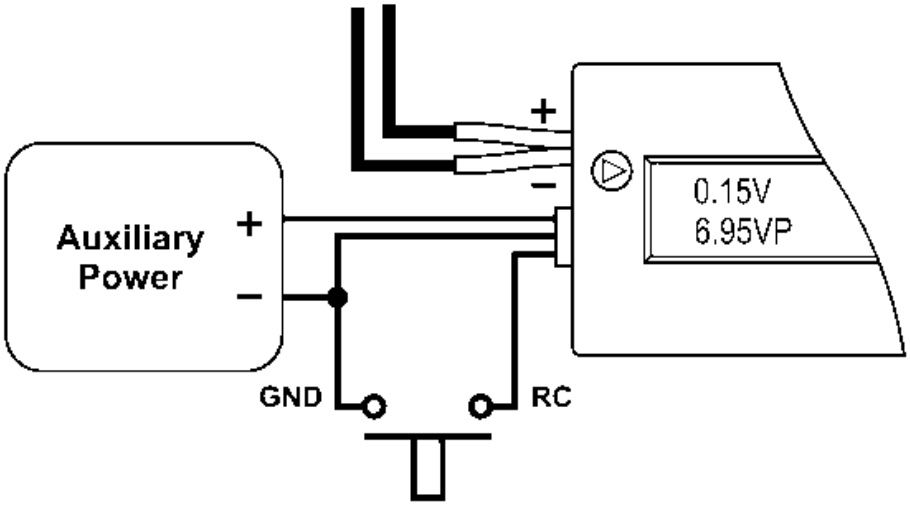



The second line displays the elapsed time since start up in HH:MM:SS format.

## Resetting the DPM-3232

There are two ways to clear the previously stored data.

1. Press and hold the Reset button (9) until the LCD display indicates “Press again 5 seconds to reset”, then release the Reset button and press again holding for 5 seconds to delete the data.
2. Use the external power source socket and connect the remote I/O (white wire) as shown below. This is marked RC on the side of the DPM to the GND or negative terminal (black wire) for 3 seconds. All previously recorded data is then erased.



## SPECIFICATIONS

| | |
|---|---|
| **Measured Parameters** | |
| Current Range Amp. (A) | 0-20A continuous, 30A max. for 30mins,<br>60A max. for 5 seconds and non-repeatable within 60second |
| Voltage Range Volt. (V) | 5-60V or 0-60V with external DC source |
| Resolution of V & I | 0.01V, 0.01A |
| **Scrolling Display of Registered Parameters** | |
| Charge: Ampere Hour (Ah) | Max. recorded Ah: 99,999AH<br>Resolution of Ah:<br>0.01Ah for total recorded Ah < 1,000Ah<br>0.1Ah for 10,000 > total recorded Ah > 1,000Ah<br>1Ah for total recorded Ah > 10,000Ah |
| Power: Watt (Wp) registered | Max. recorded W: 3600W<br>Resolution of W: 0.1W |
| Energy: Kilo Watt Hour (kWh) | Max. recorded kWh: 9999.9kWh<br>Resolution of kWh: 0.1kWh |
| Registered Peak Voltage (Vp), Min. Voltage (Vm), Peak Current (Ap), Min. Current (Am) | The new high and low values of voltage and current will replace the old ones during the metering period and saved at the end of the metering period |
| Accumulative Max. Operation Period logged | 75 hours (180s data logging interval, 1500 samples) |
| Update speed of LCD display values | 3 seconds per parameter |
| Data logging interval | Selectable from 30s to 180s (3 minutes) |
| Operating Voltage & Current | 5-60VDC, 12mA |
| External DC Source | 5-60VDC, 8mA-12mA |
| Operating Temperature | 0 to 40°C, non-condensing humidity |
| Storage Temperature | -10°C to 60°C |
| **Construction** | |
| LCD Display | VA = 54 x 14.4mm, 16 character x 2 row STN 5*8 dots |
| Housing Material | Polycarbonate |
| Dimension & Weight | 75(L) x 45(W) x 23(D) mm 100g approx. |
| Supplied Accessories | User manual, snap-on mount, 2 screw type connector blocks and external power cable with plug |
| Optional Accessories | 1. Data adapter module and software for data logging.<br>2. External DC power box with plug. |
| Approvals | CE EN 61326 , FCC |

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